by the doctrine of motion without any reference to the propositions of Euclid which precede it." In all, the author applies his method to forty-one examples, the treatment of which will present no difficulty to the student. If the method is not thoroughly new, it is true, and offers an interesting field for investigation.

Many of our readers have no doubt made an acquaintance with Mr. Proctor's pages already, as they originally appeared in *Knowledge.* In his preface the author states as his experience:—"I could find no interest in the differential calculus, till, after wading through 200 pages of matter having no apparent use (and for the most part really useless), I found the calculus available for the ready solution of problems in maxima and minima. This little work has been planned with direct reference to my own experience at school and college." In 114 small pages Mr. Proctor very luminously, we think, unfolds the *raison d'être* of the calculus, and by easy yet sure stages carries his reader over a good deal of ground, sufficient for a large class of students. The proofs are clear, and apparently quite level to the comprehension of a student who has a solid, but not necessarily extended, knowledge of elementary mathematics. It is a good introduction to a great subject, and is calculated to entice readers to go on further. Several well-chosen problems are fully worked out, and there are a few others for the student to tackle himself. There are not many errata, but there are slips on pp. 52, 73, 95, 109, and quite a crop on p. 110.

"First Steps in Geometry" is a reprint; it certainly well deserves an extended circulation, especially amongst intelligent mechanics and others who cannot command the assistance of teachers, for they will appreciate the way in which the writer goes about his task. His "method of showing why such and such paths should be tried, even though some may have to be given up, in searching for the solution of problems," is likely to be very suggestive to the thoughtful student. There is a vast quantity of good work in the little book, and the way in which the second book of Euclid is treated ought to find a place in our school text-books.

OUR BOOK SHELF.

The Photographer's Indispensable Hand-book. Compiled by W. D. Welford. Edited by H. Sturmey. (London: Iliffe and Son, 1887.)

THIS book is practically a complete cyclopædia on the subject of photographic apparatus, materials, and processes, &c. Those who intend purchasing articles pertaining to photography cannot do better than look through these pages, where they will find a great amount of useful knowledge and information massed together in one volume.

It would be impossible to describe the various kinds of cameras and processes, &c., which are dealt with here, but we need only add that they are profusely illustrated and well classified.

One of the latest novelties in the way of secret cameras is shown in "the watch," which, when closed, is exactly like an ordinary watch. It is opened by a spring, when a series of about half-a-dozen tubes shoot into position.

A great assortment of the different make and kinds of drop-shutters which at the present time are so largely used for instantaneous work is added.

Ueber Gemüthsbewegungen. Von Dr. G. Lange. Autorisirte Uebersetzung von Dr. H. Kurella. (Leipzig: Theodor Thomas, 1887.)

THE original essay of which this is a German translation is in Danish, and was published in 1885. The author is a Professor of Pathological Anatomy in Copenhagen, and is well known both as a practical physician and as a man of science. He does not pretend to deal fully with the complicated and difficult questions connected with the expression of the emotions. He examines, however, with much care the physical accompaniments of sorrow, joy, terror, and anger; and he offers important suggestions as to the point of view from which the entire subject can be most successfully studied. That emotions are not, in any sense which can be recognized by science, the causes of the physical phenomena associated with them is a proposition on which he lays great stress; and in support of his opinion he presents a number of arguments which deserve the attention of all who are interested in psycho-physiological studies. The German translation is very clear, and will no doubt find readers in England as well as in Germany.

Three Lectures on the Forms of Nasal Obstruction in relation to Throat and Ear Disease. By Greville Macdonald, M.D. (London: A. P. Watt, 1887.)

THESE lectures were originally delivered at the Throat Hospital, Golden Square. They do not constitute a text-book, but the author has embodied in them the results of much inquiry as to various forms of nasal obstruction. The diseases of which he treats are all of common occurrence, yet some of them have hitherto been but inadequately described, and Dr. Macdonald holds that their pathology is often totally misunderstood. His exposition, therefore, should be of service both to the student and to the general practitioner.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

"The Scenery of Scotland."

THE review by Mr. A. H. Green, of Geikie's "Scenery of Scotland," published in your paper of October 13 (p. 553), does not, I think, show any accurate appreciation of the disputable points in that work. The fundamental proposition ascribed to Hutton is "that the surface features of the land are, in the main, due to the carving and sculpturing action of denudation." Mr. Green does not seem to be aware that the truth of this doctrine may entirely depend on the definition of the words "surface features," and of the subsequent words "in the main."

As there is probably no actual "surface" existing in the world which has not been weathered more or less (except the very freshest lavas), the doctrine of Hutton, when so stated, is not only true, but it is a truism. Indeed the words "in the main" might be omitted; because it would be substantially true that all "surface features" in this literal sense are due entirely to denudation.

But if the words "surface features" be understood not literally, as confined to any mere visible surface, but as applying to all forms and shapes underlying mere surfaces, then the doctrine is open to great debate, and the truth of it turns entirely on the breadth of interpretation given to the words "in the main."

Living as I do in the Highlands, I maintain that the forms of

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our mountains have been largely determined by their geological structure, and by faults, contortions, and subsidences in the strata of which they are composed.

I cannot argue this question here. Suffice it to say that the "Great Gutter Theory," as I venture to call it, does not, in my opinion, explain our hills or our glens. There has been, no doubt, enormous denudation. But "in the main" the forms express structure, and the effects of subterranean force.

Mr. Green refers to the "graphic illustrations" of Mr. Geikie's book. But unfortunately those illustrations are sometimes very incorrect. For example, the general view given of the south-western termination of the Highland ranges, as seen from above Gourock on the Clyde, is a view as defective and incorrect as it is possible for a geological landscape to be. I know that range of hills well, and have seen it since my childhood in every variety of light and shadow. I have also drawn it frequently, and know almost every line of it by heart. It presents a section across a great anticlinal, as was first pointed out to me by Murchison; and it is full of surface markings which reveal its structure. Not one line of these is given in Mr. Geikie's drawing. If he had been sketching a set of mole-hills he could not have made them more featureless—more utterly devoid of their distinctive forms.

Let us have facts before theories. Let us have our hills so drawn as to express the lines of structure as they are seen in Nature, and in their relation to outline. But very often the eye sees nothing except what the brain behind it has preconceived; and a geologist who draws a mountain with a theory of guttering in his head, is pretty sure to make a mess of it.

There is really nothing in the argument about an average level along the tops, as any sure indication of an original "tableland," with all its hollows due to guttering. All sedimentary materials having an average composition, when subjected to strains, pressures, or fractures, would, and must, exhibit average resulting forms. This general fact is equally consistent with more than one explanation.

I believe Mr. Geikie has modified his former views as to the action of ice. A closer inspection of the Highlands will, I am convinced, modify greatly in other ways his teaching as to the small share which structure, and subterranean force, have had in determining the physical geography of the country.

October 15. ARGYLL.

IN your last issue Prof. A. H. Green, reviewing Dr. A. Geikie's "The Scenery of Scotland viewed in Connexion with its Physical Geology," described the alleged resemblance between the Durness fossils and certain North American types as "an announcement of the greatest interest." The fact is certainly of the "greatest interest," but the "announcement" was made nearly thirty years ago by the late J. W. Salter in the *Quarterly Journal* of the Geological Society, 1858, p. 381. Mr. Salter refers to the fauna as "this truly North American assemblage," and compares the species one by one with Prof. Hall's types.

CH. CALLAWAY.

Wellington, Shropshire, October 16.

[WE have referred these letters to Mr. Green, who has sent us the following reply.—ED.]

IT is well known that the Duke of Argyll has long been a strenuous and consistent opponent of the views as to the origin of the surface features of the earth which are accepted by the majority of geologists. Indeed, if I had been disposed to be personal, I do not think that I could have quoted a more pertinent illustration than his Grace of a fact in the history of opinion to which I drew attention in the opening part of my review of the "Scenery of Scotland." He hears not Moses and the prophets, and I fear he will not be persuaded by the pleadings of one of their humbler followers; but if he will let me have my small say, I will first point out that his objection to the expression "surface features" seems to me to savour a little of quibbling. It is a general rule of criticism to interpret any ambiguous words by the context. The whole tenor of my article shows that I did not use the words in the first of the two meanings which the Duke says they may bear. Again, I am quite prepared to admit that geological structure has had a large share in determining the form of the ground; and I cannot find that either Dr. Geikie, or any other upholder of the Gutter Theory (I thank thee, Duke, for teaching me that word: no happier designation could be found), denies that subterranean force has played an important part in determining the physical geology of a country. Rather the contrary, for hear Dr. Geikie himself. He avows himself wishful that his reader should "recognize that a belief in the paramount efficacy of superficial denudation in the origin of the features of the land is compatible with the fullest admission of the existence and potency of subterranean disturbance. Inability to make this recognition," he says, "has led to absurd misconceptions and misrepresentations of the views of those who hold that the topography of the land is essentially the result of a process of sculpture" ("Scenery of Scotland," pp. 95, 96).

I will leave Dr. Geikie to take care of himself and defend the drawing the accuracy of which is impugned by his critic. I do not know the special landscape of Fig. 19, but I have enjoyed a few panoramic views of Highland scenery, and I can honestly say thus much: I have everywhere recognized those surface *markings* (may I again congratulate his Grace on the happiness of this phrase?) which indicate the geological structure of the ground beneath, but I have in every case been still more struck by that general flat-toppedness on which special stress is laid by Dr. Geikie. The comparatively slight prominence given to these surface markings in Fig. 19 will be easily understood if w bear in mind the one point which that cut was intended to illustrate.

I may add that I am extremely sorry if any words of mine seem to imply that I grudge my old friend Salter the credit due to him with regard to the Durness fossils. The expression I have used could be made to bear this meaning, and I am much obliged to Dr. Callaway for giving me an opportunity of disavowing any such intention. A. H. GREEN.

Leeds, October 20.

A Hydroid Parasitic on a Fish.

DURING my studies the past summer at the Newport Marine Laboratory I captured a single specimen of an osseous fish, *Seriola zonata*, Cuv., which exhibits a most interesting example of parasitism or possibly commensalism. Upon the outer wall of its body an extraordinary hydroid was found to have attached itself. As this mode of life is unique for a hydroid, it is thought that a mention of it, and a statement of the peculiar modifications which the hydroid has suffered, may be not without interest to others besides special students of the jelly-fishes. The hydroid is new to science, and on that account the name Hydrichthys is suggested to designate it. The hydroid will later be described and figured under the name *Hydrichthys mirus*, gen. et sp. nov.

The colony of Hydrichthys is found on the side of the body and near to the anal fin of the fish, Seriola. It forms a reddish cluster or patch of bodies, and was at first mistaken for a fungoid growth. When it was examined by means of a microscope its animal nature was easily seen and its hydroid affinities clearly made out. The fish was kept alive in an aquarium and medusæ raised from the attached hydroid. The hydroid colony is composed of two sets of individuals. These two kinds of individuals arise from a flat plate formed of branching tubes, by which the colony is attached to the body of the fish. The two kinds of individuals noticed in the cluster are the sexual bodies (gonosomes), and the "filiform bodies" (structures of unknown function).

The sexual bodies have the form of grape-like clusters of buds mounted on small contractile peduncles, which branch from a central axis or stalk. The filiform bodies are simple, elongated, flask-shaped structures, destitute of appendages, with a central cavity and terminal orifice. Neither of these two kinds of individuals have tentacles around or near a *mouth opening*, nor any structures which can be compared with these bodies, which are almost universal among fixed hydroids.

The first kind of individuals are the gonosomes or sexual bodies. They arise from the flat basal plate of branching tubes, by which the union of the colony with the outer wall of the fish is effected. Each hydroid gonosome consists of a main stem with lateral branches. At the end of each lateral branch there is a crowded cluster of small buds, which are immature jelly-fishes in all stages of growth. Each gonosome resembles a bunch of reddish and orange-coloured grapes.

The filiform bodies are simpler in structure than the sexual clusters or gonosomes. They are destitute of tentacles and are flask-like, with a cavity and terminal orifice. They are very sensitive, and move about with freedom, never, however, being

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